Pathogenesis of Multiple Sclerosis Demyelination compared to Demyelinating Viruses in Animals

FACULTAT DE VETERINÀRIA

Aina Bonet Arribas, June 2017

Universitat Autònoma de Barcelona

Introduction

Multiple sclerosis (MS) is a chronic autoimmune demyelinating disease of the human central nervous system (CNS). It is the leading cause of non-traumatic disability in young and middle-aged people and has a great socioeconomic impact in developed countries. Given that MS is a complex disease with an unknown cause, no animal model fully reproduce all of the features of MS faithfully.

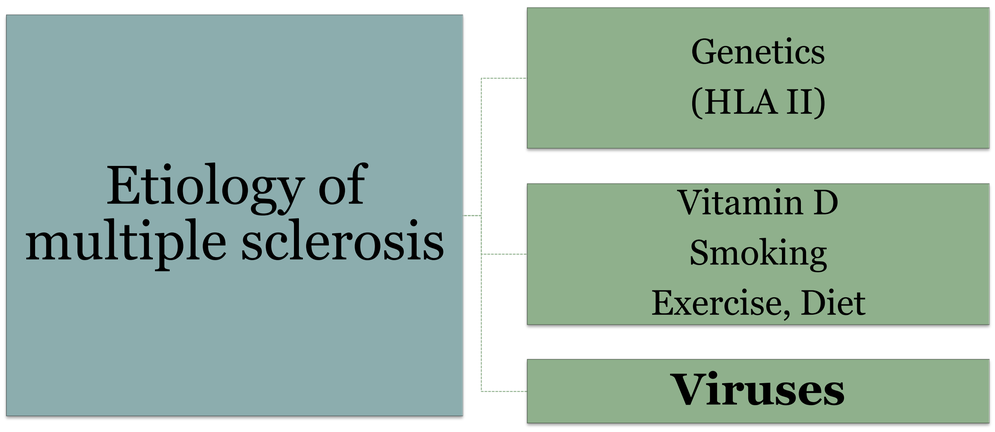

Figure 1. Triggers of autoimmunity in MS

Objectives

- Consider the possible role of virus in the development of ME and understand its pathogenesis.
- Give an insight to animal virus-induced models and compare their pathogenesis with MS.
- Find which model, currently or potentially in use, could help to move forward in the investigation of MS.

Pathogenesis of demyelination

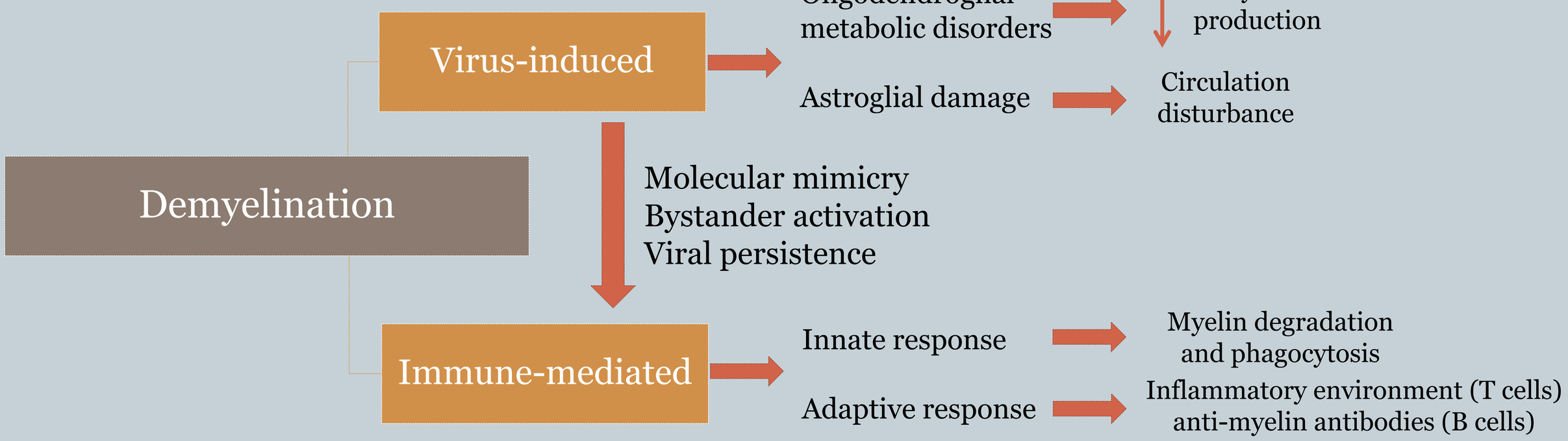

Figure 2. Possible role of viruses and immunity in ME demyelination

Animal virus	Demyelinating mechanism
Theiler ‘s murine encephalomielitis virus	Virus-induced autoimmunity
Mouse hepatitis virus	Primary demyelination by virus replication
Canine distemper virus	Non-inflammay acute demyelination by virus replication and immune-mediated inflammatory chronic demyelination

Table 1. Examples of animal demyelinating viruses and their demyelinating mechanisms.

Conclusions

- Epidemiological studies suggest that a viral infection may result in autoimmune attack against CNS in MS.
- Canine distemper virus is a natural occurring animal model for MS that can mimic some aspects of MS.
- Further study of virus-induced demyelination mechanisms need to be performed.
- It is important to combine the study of demyelination mechanisms in different animal models to get a global view of MS pathogenesis.